

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-46 (Canceled).

Claim 47 (Currently Amended): ~~A method according to claim 41~~ A computer based method for controlling an industrial process that includes at least two unit processes, comprising:

directly controlling the industrial process by a control model including one or more algorithms;

delivering process data from the industrial process to the control model;

executing an automatic diagnosis of validity of the process data retrieved from the industrial process for preventing irrelevant process data from being used as an input in the control model,

wherein the executing an automatic diagnosis includes executing at least two predictions of a given process variable with different sets of measured variables as an input to a predicting model for executing said at least two predictions, observing a deviation between a predicted value and a measured value of said process variable, and evaluating an observed deviation pattern for deciding whether the measured value of said process variable should or should not be used as the input in at least one of the control model and the separate process model.

Claim 48 (Currently Amended): ~~A method according to claim 41~~ A computer based method for controlling an industrial process that includes at least two unit processes, comprising:

directly controlling the industrial process by a control model including one or more algorithms;

delivering process data from the industrial process to the control model;

executing an automatic diagnosis of validity of the process data retrieved from the industrial process for preventing irrelevant process data from being used as an input in the control model, wherein the executing an automatic diagnosis includes:

measuring a value of at least two process variables at at least one location in the process;

predicting said at least two process variables by a predicting model for a relevant part of the process and with given boundary conditions;

observing a deviation between a predicted value and a measured value of each of said at least two process variable; and

evaluating the observed deviation for deciding whether any of the measured values of said process variables should or should not be used as the input in at least one of the control model and the separate process model.

Claim 49 (Previously Presented): A method according to claim 47, wherein when a specific process variable is predicted by the predicting model, the measured value of the specific process variable is excluded in the predicting model.

Claim 50 (Previously Presented): A method according to claim 48, wherein values of at least three process variables are measured, predicted, and evaluated as to their individual deviations between measured and predicted values.

Claim 51 (Previously Presented): A method according to claim 48, wherein a number of measured and predicted process variables is at least four; and

wherein said process variables are divided into at least two groups, said two groups having at least one common process variable, and wherein, for each respective group, deviations between measured and predicted values of the process variables of that respective group are compared.

Claim 52 (Previously Presented): A method according to claim 47, wherein, upon an observation of a deviation pattern that indicates malfunctioning of a sensor, a measurement of at least one further process variable, a value of which is related to a value of the at least one further process variable measured by said sensor, is initiated and compared to a predicted value or set point value for said at least one further process variable.

Claim 53 (Previously Presented): A method according to claim 47, wherein, upon an observation of a deviation pattern that indicates malfunctioning of a sensor, a function of at least one process controlling means, a function of which is related to a value of a process variable measured by said sensor, is checked.

Claim 54 (Previously Presented): A method according to claim 47, wherein an overall optimization of the process is based on a result of said measurements and predictions of the process variables, evaluation of deviations, and observation of individual sensor malfunctioning.

Claim 55 (Previously Presented): A method according to claim 47, wherein the predicting model comprises a physical model based on physical laws for at least one of:

a hydraulic flow in the process;  
a mass balance in the process;  
an energy or a temperature balance in the process.

Claim 56 (Previously Presented): A method according to claim 55, wherein, upon detection of certain discrepancies between model predictions and measurements, an adjustment of the predicting model is executed based on a result of said measuring, prediction, and evaluation.

Claim 57 (Previously Presented): A method according to claim 54, wherein the process is optimized with regard to at least one of product quality, economy, environmental aspects, energy consumption, and process equipment maintenance.

Claim 58 (Previously Presented): A method according to claim 55, wherein the predicting model includes an empirical model for its prediction, and wherein, upon a rebuilding of the process, said empirical model is rebuilt or replaced based on predictions from said physical model.

Claim 59 (Currently Amended): A method according to claim ~~[[41]]~~ 47, wherein the process is a continuous or semi-continuous chemical process, for production of pulp and paper or board.

Claims 60-65 (Canceled).

Claim 66 (Currently Amended): A computer based system ~~according to claim 60, for~~  
controlling an industrial process including at least two unit processes, said system  
comprising:

a control model including one or more algorithms for directly controlling the  
industrial process;

means for delivering process data from the industrial process to the control model,  
operation of the control model being based on said process data;

diagnosis means for executing an automatic diagnosis of validity of the process data  
retrieved from the industrial process for preventing irrelevant process data from being used as  
an input in the control model, wherein the diagnosis means includes:

means for measuring a value of at least two process variables at at least one  
location in the process;

means for predicting values of at least one process variable with different sets  
of measured variables as an input to a predicting model;

means for observing a deviation between predicted and measured values of  
said process variable and for evaluating observed deviations for deciding a validity of  
the measured value of said process variable as an input to at least one of the control  
model and the process model.

Claim 67 (Currently Amended): A computer based system ~~according to claim 60, for~~  
controlling an industrial process including at least two unit processes, said system  
comprising:

a control model including one or more algorithms for directly controlling the  
industrial process;

means for delivering process data from the industrial process to the control model,  
operation of the control model being based on said process data;

diagnosis means for executing an automatic diagnosis of validity of the process data  
retrieved from the industrial process for preventing irrelevant process data from being used as  
an input in the control model, wherein the diagnosis means includes:

means for measuring a value of at least two process variables at at least one  
location in the process;

means for predicting the values of said at least two process variables by a  
predicting model for a relevant part of the process and with given boundary  
conditions;

means for observing a deviation between measured and predicted values of  
each of said at least two process variables; and

means for evaluating observed deviations for deciding a validity of the  
measured values of said process variables as an input to at least one of the control  
model and the process model.

Claim 68 (Previously Presented): A computer based system according to claim 67,  
wherein values of at least three process variables are measured, predicted, and evaluated as to  
their deviations.

Claim 69 (Previously Presented): A computer based system according to claim 66,  
wherein the predicting means excludes a measurement of a certain process variable as an  
input when predicting a value of that certain process variable.

Claim 70 (Previously Presented): A computer based system according to claim 67, wherein a number of predicted process variables is at least four, wherein said process variables are divided into at least two groups having at least one common process variable, and further comprising means for comparing and evaluating, for each respective group, deviations between predicted and measured values of the variables of that respective group.

Claim 71 (Currently Amended): A computer based system according to claim [[60]] 70, wherein the measured values are measurements, by sensors, and wherein evaluating means observe a deviation pattern that indicates malfunctioning of any of the sensors.

Claim 72 (Previously Presented): A computer based system according to claim 71, further comprising means for initiating a measurement of at least one further process variable, a value of which is related to a value of the variable measured by one of the sensors, upon observation of said deviation pattern indicating a malfunctioning sensor.

Claim 73 (Previously Presented): A computer based system according to claim 71, further comprising means for initiating a checking of a function of at least one process controlling means, a function of which is related to a value of the process variable measured by one of the sensors, upon observation of said deviation pattern indicating a malfunctioning sensor.

Claim 74 (Previously Presented): A computer based system according to claim 66, wherein the predicting means includes a model based on physical laws for at least one of a hydraulic flow in the process, a mass balance in the process, and an energy balance in the process.

Claim 75 (Previously Presented): A computer based system according to claim 74, wherein the evaluating means adjusts the physical model upon observation of a certain discrepancy between model predictions and sensor measurements.

Claim 76 (Currently Amended): A computer based system according to claim [[61]] 66, wherein the process model for simulating the process is configured to execute an overall optimization of the process based on the process data delivered to it as an input and as a result of measurements and predictions of process variables, evaluation of deviations, and observation of individual sensor malfunctioning by the diagnosis means.

Claim 77 (Previously Presented): A computer based system according to claim 76, wherein the process model is configured to optimize the process with regard to at least one of product quality, total economy, environmental aspects, energy consumption, and maintenance of process equipment.

Claim 78 (Currently Amended): A computer based system according to claim [[61]] 66, wherein the process is a continuous or semi-continuous chemical process.

Claim 79 (Currently Amended): Use of a computer based system according to claim [[61]] 66 for controlling an industrial process.

Claim 80 (Currently Amended): Use of a computer based system according to claim [[61]] 66 for controlling a process for manufacturing pulp and paper or board.



Claim 81 (New) A method according to claim 47, wherein the process is simulated by a separate process model, and wherein the control model is updated by and provided with set point values from the separate process model.

Claim 82 (New) A method according to claim 81, wherein the control model is modified by the separate process model based on the automatic diagnosis.

Claim 83 (New) A method according to claim 81, wherein the separate process model is provided with process data from the process, and an operation of the separate process model is based on said process data.

Claim 84 (New) A method according to claim 81, wherein the separate process model is provided with information from a diagnosis device for preventing the irrelevant process data from being used as an input in the separate process model.

Claim 85 (New) A method according to claim 81, wherein the process is simulated and optimized with regard to one or more of a plurality of issues, with given constraints, by the separate process model.

Claim 86 (New) A method according to claim 48, wherein the process is simulated by a separate process model, and wherein the control model is updated by and provided with set point values from the separate process model.

Claim 87 (New) A method according to claim 86, wherein the control model is modified by the separate process model based on the automatic diagnosis.

Claim 88 (New) A method according to claim 86, wherein the separate process model is provided with process data from the process, and an operation of the separate process model is based on said process data.

Claim 89 (New) A method according to claim 86, wherein the separate process model is provided with information from a diagnosis device for preventing the irrelevant process data from being used as an input in the separate process model.

Claim 90 (New) A method according to claim 86, wherein the process is simulated and optimized with regard to one or more of a plurality of issues, with given constraints, by the separate process model.

Claim 91 (New): A method according to claim 48, wherein the process is a continuous or semi-continuous chemical process, for production of pulp and paper or board.

Claim 92 (New) A computer based system according to claim 66, further comprising a process model for simulating the process, said process model configured to update the control model and provide the control model with set point values for its operation.

Claim 93 (New) A computer based system according to claim 92, wherein the process model is configured to modify the control model based on process data validity information from the diagnosis means.

Claim 94 (New) A computer based system according to claim 92, further comprising means for providing the process model with process data, and an operation of the process model is based on said process data.

Claim 95 (New) A computer based system according to claim 92, wherein the diagnosis means provides the process model with information for preventing irrelevant process data from being used as an input in the process model.

Claim 96 (New) A computer based system according to claim 92, wherein the process model is configured to simulate and optimize the process with regard to one or more of a plurality of issues, with given constraints.

Claim 97 (New) A computer based system according to claim 67, further comprising a process model for simulating the process, said process model configured to update the control model and provide the control model with set point values for its operation.

Claim 98 (New) A computer based system according to claim 97, wherein the process model is configured to modify the control model based on process data validity information from the diagnosis means.

Claim 99 (New) A computer based system according to claim 97, further comprising means for providing the process model with process data, and an operation of the process model is based on said process data.

Claim 100 (New) A computer based system according to claim 97, wherein the diagnosis means provides the process model with information for preventing irrelevant process data from being used as an input in the process model.

Claim 101 (New) A computer based system according to claim 97, wherein the process model is configured to simulate and optimize the process with regard to one or more of a plurality of issues, with given constraints.

Claim 102 (New): A computer based system according to claim 67, wherein the process is a continuous or semi-continuous chemical process.

Claim 103 (New): Use of a computer based system according to claim 67 for controlling an industrial process.

Claim 104 (New): Use of a computer based system according to claim 67 for controlling a process for manufacturing pulp and paper or board.